IN THE CLAIMS

Please amend the claims and add new claims 21 to 25 as follows:

1. (currently amended) A quartz glass crucible for pulling up a silicon single crystal, said quartz glass crucible **comprising:** [~~having~~] an opaque outer layer formed by melting natural silica powder and a **first** transparent layer formed on [~~the~~] **an** inside thereof, **wherein** [~~characterized in that~~] the **first** transparent layer is made of natural quartz glass **and has** [~~with~~] a thickness of 0.4 to 5.0 mm, and **wherein** a **second** transparent layer made of [~~a~~] synthetic quartz glass is formed [~~on~~] **over at least an** [~~the~~] inside **region** of the crucible **that extends** [~~in the range~~] from [~~at least~~] 0.15 **L** to 0.55 L **from a center of a bottom of an inner surface of the quartz glass crucible**[~~in terms of~~], **wherein L is** a distance [~~L~~] from the center of the bottom of the inner surface of the quartz glass crucible to **an** [~~the~~] upper end face **of the quartz glass crucible adjacent** [~~along~~] the inner surface of the crucible.

2. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 1, **wherein** [~~characterized in that a~~] **the second** transparent layer **has** [~~made of a synthetic quartz glass with~~] a thickness of 0.2 to 1.5 mm [~~is formed in the range from 0.15 to 0.55 L in terms of a distance L from the center of the bottom of the inner surface of the quartz glass crucible to the upper end face along the inner surface thereof~~].

3. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 1, **wherein the** [~~characterized in that an~~] inner surface of

the crucible in the range from 0.6 **L** to 1.0 L [~~**in terms of a distance L**~~] from the center of the bottom of the inner surface of the quartz glass crucible to the upper end face along the inner surface thereof is **provided by the first** [~~**a**~~] transparent layer [~~**made**~~] of natural quartz glass.

4. (currently amended) The quartz glass crucible [~~**for pulling up a silicon single crystal**~~] according to Claim 1, **wherein** [~~**characterized in that**~~] **the second** [~~**a**~~] transparent layer [~~**made of a synthetic quartz glass with**~~] **has** a thickness of 0.2 mm or less [~~**is formed**~~] on the inner surface of the crucible in [~~**the**~~] **a** range from 0.6 **L** to 1.0 L [~~**in terms of a distance L**~~] from the center of the bottom of the inner surface of the quartz glass crucible [~~**to the upper end face along the inner surface thereof**~~].

5. (currently amended) The quartz glass crucible [~~**for pulling up a silicon single crystal**~~] according to Claim 1, **wherein** [~~**characterized in that**~~] **the second transparent layer has** an average OH group concentration CA [~~**in the a transparent layer made of a synthetic quartz glass is**~~] from 100 to 300 ppm, **the first transparent layer has** an average OH group concentration CB [~~**in the transparent layer made of natural quartz glass is**~~] from 60 to 150 ppm, **and the opaque outer layer has** an average OH group concentration CC [~~**in the opaque outer layer made of natural quartz glass is**~~] from 20 to 60 ppm, and [~~**they**~~] **said OH group concentrations** satisfy the relation: CA > CB > CC.

6. (currently amended) A method for producing a quartz glass crucible for pulling up a silicon single crystal [~~according to Claim 1~~], [~~characterized by~~] **said method comprising:**

making an inner cavity of a quartz glass crucible base body mounted on a rotatable mold **in** a high temperature atmosphere,

feeding natural silica powder to the high temperature atmosphere in [~~the~~] **an inner cavity** [~~inside~~] of an opaque outer layer after or during the formation of the opaque outer layer,

[~~by~~] partially melting the inner cavity to form a **first** transparent layer [~~made~~] of natural quartz glass on [~~the~~] **an** entire inner surface of the opaque outer layer by melting and vitrifying the natural silica powder, and [~~then~~]

feeding a synthetic silica powder and melting and vitrifying the synthetic silica powder to form a **second** transparent layer [~~made~~] of [~~a~~] synthetic quartz glass on [~~the~~] **an** inside **surface** of the **first transparent layer of natural quartz glass** [~~crucible~~] in [~~the range from~~] at least **a region extending from** 0.15 **L** to 0.55 L **from a center of a bottom of an inner surface of the crucible** [~~in terms of~~] **wherein L is** a distance [~~L~~] from the center of the bottom of the **inside** [~~inner~~] surface of the quartz glass crucible [~~having the transparent layer made of natural quartz glass~~] to [~~the~~] **an** upper end face **adjacent** [~~along~~] the **inside** [~~inner~~] surface of the crucible.

7. (currently amended) A quartz glass crucible for pulling up a silicon single crystal, said quartz glass crucible **comprising:** [~~having~~] an opaque outer layer [~~made~~] of natural quartz glass and a transparent layer formed on [~~the~~] **an** inside thereof, **wherein**

[~~characterized in that~~] the **transparent layer, after pulling up a single crystal, has a** number of brown rings per unit area (cm^2) [~~observed~~] in **a region** [~~the range~~] from **an** [~~the~~] initial surface level of a silicon melt to 0.3 M **therebelow,** [~~in terms of~~] **wherein M is** a length [~~M~~] from the initial surface level of the silicon melt to **a** [~~the~~] surface level of **a** [~~the~~] remaining melt after pulling up a single crystal measured along the inner surface of the quartz glass crucible**, said number of brown rings being** [~~is~~] **at least** 1.8-fold [~~or more~~] greater than **a** [~~the~~] number of brown rings observed in **a region** [~~the range~~] up to 0.3 M above the surface level of the remaining melt.

8. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 7, **wherein** [~~characterized in that~~] the number of brown rings per unit area (cm^2) [~~observed~~] in the **region** [~~range~~] from the initial surface level of a melt to 0.3 M **therebelow** is **at least** 2.5-fold [~~or more~~] greater than the number of brown rings [~~observed~~] in the **region** [~~range~~] up to 0.3 M above the surface level of the remaining melt.

9. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 7, [~~said quartz glass crucible having an opaque outer layer made of natural quartz glass and a transparent layer formed on the inside thereof,~~] **wherein** [~~characterized in that~~] **the** [~~a~~] transparent layer **is** [~~made~~] of natural quartz glass or a mixture of natural and synthetic quartz glasses **and forms** [~~is formed on~~] the inner surface of the crucible in **a region** [~~the range~~] **extending** from the initial surface level of a silicon melt to 0.3 M [~~in terms of a length M from the initial surface~~

~~level of the silicon melt to the surface level of the remaining melt after pulling up a single crystal measured along the inner surface of the quartz glass crucible~~], **the transparent layer including** a transparent **synthetic-quartz-glass** layer [~~made~~] of [~~a~~] synthetic quartz glass is formed on the inner surface of the crucible in **a region** [~~the range~~] **extending** up to 0.3 M above the surface level of the remaining melt, and the number of brown rings per unit area (cm^2) [~~observed~~] in the **region** [~~range~~] **extending** from the initial surface level of the melt to 0.3 M **below** is **at least** 1.8-fold [~~or more~~] greater than the number of brown rings [~~observed~~] in the **region** [~~range~~] **extending** up to 0.3 M above the surface level of the remaining melt.

10. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 9, **wherein** [~~characterized in that~~] the number of brown rings per unit area (cm^2) [~~observed~~] in the **region** [~~range~~] **extending** from the initial surface level of a melt to 0.3 M is **at least** 2.5-fold [~~or more~~] greater than the number of brown rings [~~observed~~] in the range up to 0.3 M above the surface level of the remaining melt.

11. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 7, [~~said quartz glass crucible having an opaque outer layer made of natural quartz glass and a transparent layer formed on the inside thereof,~~] **wherein** [~~characterized in that~~] the inner surface of the crucible in the **region** [~~range~~] **extending** from the initial surface level of a melt to 0.3 M is subjected to an etching treatment or a sandblast process, and the number of brown rings per unit area

(cm^2) [~~observed~~] in the **region** [~~range~~] after [~~it is used for~~] pulling up **the** [~~a~~] silicon single crystal is **at least** 1.8-fold [~~or more~~] greater than the number of brown rings [~~observed~~] in the **region** [~~range~~] up to 0.3 M above the surface level of the remaining melt which is not subjected to the etching treatment or the sandblast process.

12. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 11, **wherein** [~~characterized in that~~] the number of brown rings per unit area (cm^2) [~~observed~~] in the **region** [~~range~~] from the initial surface level of a melt to 0.3 M is 2.5-fold or more greater than the number of brown rings [~~observed~~] in the **region** [~~range~~] up to 0.3 M above the surface level of the remaining melt.

13. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 7, **wherein** [~~characterized in that~~] the number of brown rings [~~observed~~] in the **region** [~~range~~] up to 0.3 M above the surface level of the remaining melt is 0.02 to 0.9/cm^2.

14. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 7, **wherein** [~~characterized in that~~] the number of brown rings per unit area (cm^2) [~~observed~~] in the **region** [~~range~~] from the initial surface level of a melt to 0.3 M is 2.0 to 5.0/cm^2.

15. (currently amended) A method for producing a quartz glass crucible for pulling up a silicon single crystal [~~according to Claim 7~~], [~~characterized~~] **the method comprising:**

[~~by~~] making an inner cavity **in** [~~of~~] a quartz glass crucible base body mounted on a rotatable mold **in** a high temperature atmosphere,

feeding natural silica powder or a powder mixture of natural and synthetic silicas to the high temperature atmosphere in **an** [~~the~~] inside of an opaque outer layer **of the quartz glass crucible base body** after or during the formation of the opaque outer layer,

[~~by~~] partially melting the inner cavity to form a **first** transparent layer [~~made~~] of natural quartz glass or a mixture of natural and synthetic quartz glasses in **a region** [~~the range~~] **extending** from the initial surface level of a melt to 0.3 M by melting and vitrifying the natural silica powder or the powder mixture of natural and synthetic silicas, **wherein M is a length from the initial surface level of the silicon melt to a surface level of a remaining melt after pulling up a single crystal measured along the inner surface of the quartz glass crucible,** and [~~then~~]

feeding a synthetic silica powder and melting and vitrifying the synthetic silica powder to form a **second** transparent layer [~~made~~] of [~~a~~] synthetic quartz glass on the inner surface of the crucible in the range up to 0.3 M above the surface level of the remaining melt.

16. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 2, **wherein the** [~~characterized in that an~~] inner surface of the crucible in the range from 0.6 **L** to 1.0 L [~~in terms of a distance L~~] from the center

of the bottom of the inner surface of the quartz glass crucible to the upper end face along the inner surface thereof is **provided by the first** [~~a~~] transparent layer [~~made~~] of natural quartz glass.

17. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 2, **wherein** [~~characterized in that~~] **the second** [~~a~~] transparent layer [~~made of a synthetic quartz glass with~~] **has** a thickness of 0.2 mm or less [~~is formed~~] on the inner surface of the crucible in [~~the~~] **a** range from 0.6 **L** to 1.0 L [~~in terms of a distance L~~] from the center of the bottom of the inner surface of the quartz glass crucible [~~to the upper end face along the inner surface thereof~~].

18. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 2, **wherein** [~~characterized in that~~] **the second transparent layer has** an average OH group concentration CA [~~in the a transparent layer made of a synthetic quartz glass is~~] from 100 to 300 ppm, **the first transparent layer has** an average OH group concentration CB [~~in the transparent layer made of natural quartz glass is~~] from 60 to 150 ppm, **and the opaque outer layer has** an average OH group concentration CC [~~in the opaque outer layer made of natural quartz glass is~~] from 20 to 60 ppm, and [~~they~~] **said OH group concentrations** satisfy the relation: CA > CB > CC.

19. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 3, **wherein** [~~characterized in that~~] **the second transparent**

layer has an average OH group concentration CA [~~in the a transparent layer made of a synthetic quartz glass is~~] from 100 to 300 ppm, the first transparent layer has an average OH group concentration CB [~~in the transparent layer made of natural quartz glass is~~] from 60 to 150 ppm, and the opaque outer layer has an average OH group concentration CC [~~in the opaque outer layer made of natural quartz glass is~~] from 20 to 60 ppm, and [~~they~~] said OH group concentrations satisfy the relation: CA > CB > CC.

20. (currently amended) The quartz glass crucible [~~for pulling up a silicon single crystal~~] according to Claim 4, wherein [~~characterized in that~~] the second transparent layer has an average OH group concentration CA [~~in the a transparent layer made of a synthetic quartz glass is~~] from 100 to 300 ppm, the first transparent layer has an average OH group concentration CB [~~in the transparent layer made of natural quartz glass is~~] from 60 to 150 ppm, and the opaque outer layer has an average OH group concentration CC [~~in the opaque outer layer made of natural quartz glass is~~] from 20 to 60 ppm, and [~~they~~] said OH group concentrations satisfy the relation: CA > CB > CC.

21. (new) A quartz glass crucible for pulling up a silicon single crystal, said crucible comprising:

an opaque outer layer formed by melting natural silica powder and having an inward facing surface facing toward an interior space of the crucible;

a first transparent layer formed on the inward facing surface of the opaque outer layer, the first transparent layer being of natural quartz glass and having a thickness of 0.4 to 5.0 mm, said first transparent layer having an inward facing surface facing toward the interior space of the crucible; and

a second transparent layer of synthetic quartz glass formed over at least a portion of the inward facing surface of the first transparent layer;

the second transparent layer constituting at least part of an inner surface of the quartz glass crucible facing the interior space thereof;

the portion of the first transparent layer over which the second transparent layer is formed extending over an area defined between two distances along the inner surface from a center of a bottom of the inner surface of the quartz glass crucible;

one of said distances being 0.15 times a total distance along the inner surface from the center of the bottom of the crucible to an upper end of the inner surface of the crucible; and

the other of said distances being 0.55 times the total distance.

22. (new) The quartz glass crucible of claim 21 wherein the second transparent layer has a thickness of 0.2 to 1.5 mm between said distances from the center of the bottom of the crucible.

23. (new) The quartz glass crucible according to Claim 1, wherein the second transparent layer includes an upper transparent layer portion extending beyond a distance of 0.6 times the distance from the center of the bottom of the crucible to the upper end of

the inner surface of the crucible, said upper transparent layer portion being 0.2 mm or less in thickness.

24. (new) The quartz glass crucible according to Claim 21, wherein the inward facing surface of the first transparent layer of natural quartz glass constitutes the inner surface of the crucible beyond a distance of 0.6 times the distance from the center of the bottom of the crucible to the upper end of the inner surface of the crucible.

25. (new) The quartz glass crucible according to Claim 21, wherein

the opaque outer layer has an average OH group concentration from 20 to 60 ppm,

the first transparent layer has an average OH group concentration greater than that of the opaque outer layer and in a range of from 60 to 150 ppm and, and

the second transparent layer has an average OH group concentration greater than that of the first transparent layer and in a range of from 100 to 300 ppm.